

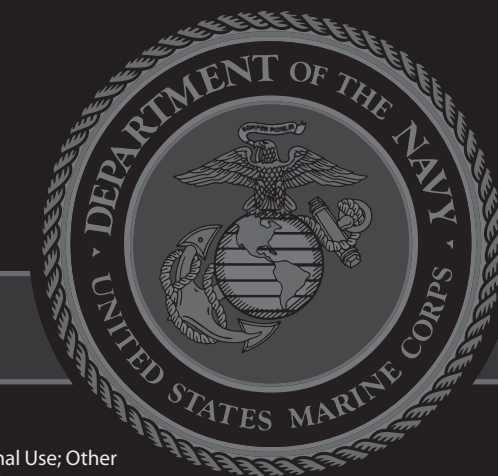


MARINE AVIATION DETACHMENT

Patuxent River



Spring 2009 Magazine



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Commanding Officer Comments



Greetings from Pax River and welcome to the first edition of the MAD Pax Magazine. The purpose of this magazine is twofold. The first, and most important, is to provide a link to the Marines working at Pax River through the Point of Contact list in the back. The hope being that if you have questions about an aircraft or aircraft system, you will find someone to call who can answer that question. The second reason for the magazine is to let you know a little bit about what is going on at Pax River. I have asked the Marines here who work in the Program offices, the Competencies and the Test Squadrons to provide some quick update information for the projects they are working on. For those unfamiliar with Pax River and NAVAIR this will also help you understand a little of what takes place here.

I realize that often the Acquisition system can seem a painfully slow process, but there are lots of things happening here at Pax. The Marines here do their best to deliver hardware, software, and capability to the Fleet as quickly as possible. The challenge is always getting something out quickly, but at the same time getting something out that is right. It is an exciting time to be involved in what is going on at Pax River. This year the first F-35s will arrive to begin the bulk of their flight testing. We have Marine aviators who will fly those test flights and we have Marine maintainers who will help to evaluate and develop the maintenance and support procedures our first squadrons will employ. Development continues on the CH-53K and those first test aircraft are on the horizon as well. Marines are actively involved with every aspect of refining the design and support strategy for that aircraft. Additionally, numerous updates and improvements to our legacy aircraft continue in order to keep them viable, lethal and effective in combat.

I hope that you will find the articles in this magazine interesting and the point of contact information useful. While the NAVAIR workforce totals about 18,000 people in and around Pax River, the 170 Marines here are able to make a difference. If you think that you are interested in being a part of what happens here at Pax and are interested in being involved with bringing new aircraft and new systems to the fleet, contact us here at the MAD.

For more information, please see our web-site at: www.marines.mil/units/hqmc/aviation/madpax/Pages/welcome02.aspx.
Semper Fi

Turbo

Col Art Tomassetti

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1. DSN telephone numbers are the same without area code.
2. For more information on the individual Program Management Offices, visit:
<http://www.navair.navy.mil/index.cfm?fuseaction=organization.default>

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ACQUISITION PROFESSIONAL UPDATE

The Marine Corps' ability to support future operational requirements depends, in part, on senior officers who have experience and training in acquisition management. The Marine Corps' Acquisition Professional community consists of two groups of officers, Acquisition Managers - officers who possess primary MOS (PMOS) 8059 and Acquisition Management Officers - officers who possess additional MOS (AMOS) 8058.

Officers in AMOS 8058 must be proficient in their PMOS and at the same time are required to gain requisite acquisition proficiency. These officers may request consideration for a lateral move to PMOS 8059 via an annual board; however, PMOS 8059 positions are limited, thus selection to PMOS 8059 is highly competitive. Unlike AMOS 8058 officers, officers in PMOS 8059 may focus on gaining required experience for senior acquisition positions. Additionally, PMOS 8059 officers may be considered for acquisition command positions.

Recent Eligibility Requirements for Lateral Move to PMOS 8059:

- **Unrestricted Officers**, Rank of **Major through Colonel** with less than 26 Years Commissioned Service.
- Must **not** have been currently slated for command as a result of the USMC Command Screening Board
- **Possessed or qualified** for additional MOS 8058 synonymous with Defense Acquisition Corps Membership
- Certified Level II in Defense Acquisition Workforce Improvement Act (DAWIA) **Primary** Acquisition Career Field
- Baccalaureate Degree from an accredited university plus
 - 24 Semester Credit Hours in Business or Business-related fields
 or
 - 24 Semester Credit Hours in DAWIA Primary Acquisition Career Field and 12 Semester Credit Hours in Business or Business-related fields

- Semester Credit Hours **Must Be** on a College Transcript
- 48-Months Acquisition Experience
 - 12 months of acquisition experience may be credited for acquisition related education
 - 18 Months may be credited for Lieutenant Colonel/O-5 Command Time

Additional information can be found at The Marine Corps Acquisition Workforce website
<https://www.marcorsyscom.usmc.mil/sites/acqworkforce/>

or at the M&RA Acquisition website

https://www.manpower.usmc.mil/portal/page?_pageid=278,1950063&_dad=portal&_schema=PORTAL

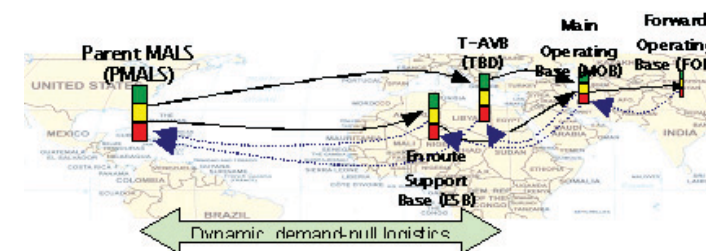
U.S. NAVAL TEST PILOT SCHOOL (USNTPS) UPDATE



- The USMC typically selects 9 students per year via a biannual board (March and August).
 - Must be rank of First Lieutenant through Major.
 - College degree in Engineering, Math, or Science highly desirable, but not mandatory.
- An update being processed to the Marine Corps Order will:
 - Reduce total flight hour requirement from 1500 to 1000
 - Simplify process for updating existing packages
- TPS seats are usually filled by specific Military Occupational Specialties, based on a projected need 18-30 months in advance of the requirement, but there is always the possibility to select any

vulnerability, MALSP II's maintenance concept is to only deploy limited maintenance capability at forward nodes to mitigate constraints that cannot be met by material buffers. At the higher end of the scale of military operations, the MALSP II logistics chain can be augmented with maintenance capability and material buffers from two Aviation Logistics Support Ships (T-AVB), Maritime Pre-positioning Force (Future) ships, and a Global Pre-position program for aviation support equipment.

In addition to AIRSpeed methodologies, MALSP II will be enabled by new logistics information technologies. Stubby pencils, logbooks, and spreadsheets will give way to decision support tools and intelligent agents in order to address the dynamics, complexities, and interdependencies associated with AIRSpeed and emerging warfighter doctrine. MALSP II is also being designed to operate in a net centric battle space which includes integration with sense and respond logistics, autonomic logistics, and in-transit/total asset visibility technologies. In addition to increasing logistics chain performance and quality of logistics planning, these enablers will push excess capability and associated footprint to the rear. Finally, MALSP II will drive the need for new skills, knowledge and education systems to ensure our logisticians can meet the dynamic and uncertain nature of future conflicts around the globe. Under MALSP II, Marines will not only know "what to pack," they will know what to leave behind.



PMA-209 AIR COMBAT ELECTRONICS PROGRAM OFFICE

PMA-209, Air Combat Electronics, is a commodity program management office that manages development, integration, fielding, and sustainment of core avionics systems across Marine Corps aviation. With fewer new airframes being designed, many of aviation's warfighting enhancements are being enabled by these systems in the areas of communications, navigation, cooperative surveillance, mission processing, and safety systems. If it is something that can be used similarly across multiple platforms, chances are PMA-209 is involved with it. They are perhaps most well known for providing the ubiquitous ARC-210 radio, which is employed in almost every modern airframe. In the past, and coming in the near future, PMA-209 is making significant contributions to USMC aircraft through integrations of systems required to meet civil air traffic management compliance mandates. Our aircraft are getting substantial warfighting applications along with the civil utilities, such as glass cockpits, modern digital processing frameworks, Blue Force Tracking, improved cues for safer recovery in Degraded Visual Environments, formerly known as 'brown-out'), and weather graphic information overlay. In addition, these upgrades are providing the foundation for simpler integration of future capabilities, including M Code Global Positioning System, Joint Precision Approach and Landing System, Mode 5 Combat ID, Digitally-aided Close Air Support connectivity, and networked tactical situational awareness in support of a Single Integrated Air Picture and Network Centric Operations. As a commodity manager, PMA-209 is also working to increase commonality across platforms in support of cost reductions and decreased expeditionary logistics footprints. PMA-209 is tightly engaged with the USMC Avionics Officer community, who manage key acquisition leadership counterpart positions in Requirements and Resourcing.

AIR 6.0 LOGISTICS AND INDUSTRIAL OPERATIONS

MARINE AVIATION LOGISTICS SUPPORT PROGRAM (MALSP) II

Transforming Expeditionary Aviation Logistics

Ever struggled with "what to pack" before traveling for an extended period of time? What if your life depended on it? Would you pack the right stuff? And, what would you base your decisions on? Marines are faced with similar challenges when executing deployment warning orders. Once launched, MALSP II will remove the guesswork out of "what to pack" in order to successfully plan, deploy, sustain, and re-deploy an expeditionary aviation logistics chain.

MALSP II is the expeditionary logistics solution that supports the Long War Concept, Marine Corps Vision and Strategy 2025, and Quadrennial Review '06. MALSP II differs mostly from its predecessor in that it is a demand-pull vice a push system (i.e., science verses art). MALSP II employs Continuous Process/systems Improvement (CPI) to provide a light, agile, flexible and responsive logistics chain to Aviation Combat Elements in order to more effectively support Marine Air Ground Task Forces. AIRSpeed (the Navy's integration of Lean, Six Sigma, and Theory of Constraints (TOC)) is a CPI methodology currently embraced by MALSP II. While Lean and Six Sigma play an important role in MALSP II, TOC is the impetus behind MALSP II's logistics chain. TOC focuses on identifying, exploiting, and/or elevating constraints. For example, a lack of transportation assets and replacement parts are constraints that were elevated by deploying material buffers in Operation Iraqi Freedom and the Horn of Africa during the MALSP II Pilot. Buffers insulate downstream nodes from variation by managing inventory levels in a time domain, i.e., time to reliably replenish.

The nodes in a MALSP II logistics chain include the Parent Marine Aviation Logistics Squadron, En-route Support Base, Main Operating Base, and Forward Operating Base. To reduce the forward logistics footprint, increase agility and deployability, and reduce logistics

applicant for any available seat.

- The USNTPS curriculum is 48 weeks long with two classes annually
 - 550 Academic Hours
 - 100 Sorties/150 Flight Hours
 - 25 Technical Reports
- USNTPS maintains and operates about 50 aircraft of 13 types.
- Students at TPS can expect to fly 15 to 20 different aircraft types during their year at the school.

Find out more at the USNTPS website:

<https://www.navair.navy.mil/USNTPS/>



AIR TEST AND EVALUATION SQUADRON 20 (VX-20)

KC-130 FLIGHT TEST

VX-20 has 3 Marine Officers on hand supporting USMC flight test requirements in the KC-130J, KC-130T, C-12, and UC-35: One Chief Test Pilot, LtCol John Albers, as well as two test pilots, Maj James Palmer and Maj Steve Puckett. Numerous projects are in work directly in support of current warfighting efforts as well as projects evaluating product enhancements.

In late 2008, the test team conducted Aircraft Survivability Equipment (ASE) flight test on the UC-35D helping to secure fleet release of an upgraded ASE capability in support of executive travel in the CENTCOM AOR. We have also been involved in preliminary planning and schedule development for flight test of the C-12 Replacement Aircraft planned for early 2010.

KC-130J AN/ALE-47 Defensive Electronic Countermeasures Effectiveness testing at Eglin AFB, FL, to evaluate the effectiveness of various techniques using

infrared airborne expendable countermeasures and flare infrared decoys, was successfully completed. Particularly noteworthy was the identification of issues associated with an Operational Flight Program software release related to survivability. The team's efforts and quick response ensured timely correction and re-release of a critical capability.

Ground and flight testing was completed on a KC-130J Command, Control, and Communications Proof of Concept Demonstration in conjunction with Marine Corps Systems Command. Ground and flight testing was also completed for the KC-130J AN/AAR-47B(V)2 Missile/Laser Warning System. Additionally, flight testing was successfully completed on the expansion of the current aircraft normal gross weight envelope of the KC-130J for takeoff and landing weight from 155,000 to 164,000 pounds. Evaluation of product enhancements to existing software on the KC-130J Block Upgrade 6.5 software was conducted, including Identification Friend or Foe (IFF) system characteristics, and follow-on flight testing to evaluate functionality of Software Versions 6.5-1 and 6.5-2 Block Upgrades of the KC-130J Mission Computer.

The team also accepted a 4th Marine Air Wing KC-130T to evaluate an Enhanced Mode S IFF system, identifying a significant deficiency that has forced the contractor to go back to the drawing board to provide the capability the Marines need.

A variable speed drogue is under development and the team has been preparing for upcoming initial flight tests of this operationally relevant capability enhancing product. The Marines of VX-20 have been involved in wind-tunnel and product development leading up to the forthcoming flight test.

Oh, and by the way, we have also been involved in planning for the movement of the Joint Strike Fighter (JSF) test article to NAS Patuxent River via aerial refueling as well as preparing for direct support of the JSF test program.



KC-130J airborne expendable safe-separation test over NAS Patuxent River

AIR TEST AND EVALUATION SQUADRON 21 (HX-21)

AH-1 FLIGHT TEST

As part of the Global War on Terror, fleet USMC H-1 pilots operating in-theater have determined that a need exists to be able to receive and transmit real time video in order to improve situational awareness and improve the time line to get weapons on the desired target. An emerging task to evaluate a video data link system on the AH-1W began in FY08 with the Tactical Video Data Link. The evaluation is ongoing.

An additional effort to increase AH-1W survivability was accomplished with the development of a new ALE-47 dual dispenser pod (DDP). The test program began in FY-08 to increase the amount of expendable countermeasures carried on the AH-1W platform in an effort to upgrade the existing aircraft defensive system. The DDP carries two ALE-47 housings vice one, thereby doubling the amount of expendables available. This phase of test was completed and the system is currently under redesign.

The AH-1W was also tasked to support AAR-47B(V)2 software optimization by gathering non-hostile environmental scenarios data. This testing was completed in FY08, however, the data is being analyzed for optimization of the software. An additional test effort is scheduled in the upcoming months.



AH-1W in a shallow dive over the NAS Patuxent River Range Complex during ALE-47 Dual Pod Dispenser developmental testing while dispensing flares.

CH-46 FLIGHT TEST

After a decade without dedicated test capability at HX-21, the Marine Corps again has a Phrog test asset at Patuxent River. HX-21 accepted an aircraft to serve as a dedicated test asset to expedite delivery of aircraft and avionics upgrades to the field. The test asset, BuNo 152578, has been booked since its arrival in May 2008. Initial efforts included testing the DoN Large Aircraft Infra-Red Countermeasures system. The test asset also supported testing of the infrared countermeasures (IRCM) system on the CH-53E serving as section support. The squadron also flew for HMX-1's Quick Reaction Assessment of the ultraviolet and IRCM. Flight testing of the IRCM on the Phrog is planned for this summer.

The CH-46E test team successfully completed flight-testing the Blue Force Tracker (BFT) system in August. Purpose of test was to verify compatibility and functionality of the BFT within airfield, terrain flight operations and transient flight. The Electronic Data Manager (EDM) was verified for daylight/night readability and night vision goggle compatibility. These tests gathered data to evaluate the system and to prove its effectiveness in battlefield situational awareness. The BFT/EDM gives the warfighter digital map capabilities in an aging analog aircraft. The Report of Test Results (RTR) is currently in the review cycle. Review of the Spiral 3 version is planned for summer 2009.

NAVAIRSYSCOM PMA-242 tasked the CH-46E test team to plan, execute, and certify the GAU-21 aircraft machine gun and mounts on the CH-46E. The GAU-21 will replace the currently used XM-218. In November, ground fit checks with the prototype FN Herstal, S.A. GAU-21 mounts were successfully conducted at Patuxent River to investigate store compatibility and Field of Fire issues. The aircraft is scheduled for instrumentation and flight testing late in 2009.

In November, the CH-46E test team successfully completed ground and flight tests designed to evaluate a prototype Power Filter Network (PFN). The purpose of testing was to determine if the PFN was effective in reducing high fluctuations in DC power output from the main generator. Results showed the PFN will help eliminate the input power noise being supplied to the new digital electronic equipment systems on the CH-46E. Less power fluctuations in DC power will also increase the life of the electronic equipment. The RTR is

PMA-205 AVIATION TRAINING SYSTEMS PROGRAM OFFICE

PMA-205 Training Systems has undergone a significant organizational change in the last year. Previously the Marine Corps fell under the Strike Department and now due to the size and complexity, the Marine Corps Department was established as its own department (PMA-205MC). Currently there are 5 Marines assigned to PMA-205.

The Marine Corps is undergoing a training transformation which was documented in the Marine Corps Aviation Training Systems (ATS) Order (MCO 3710.6) and corresponding NAVMC 3710.6 instruction. These directives were signed on 11 June 2008. One significant change is that under ATS, training is being placed under the operational control of the Marine Aircraft Wings through Marine Aviation Training Sites vice the supporting establishments. There is also a significant focus on increasing simulation and keeping the training system concurrent with the aircraft.

PMA-205 has developed Training Continuum Integration (TCI) to meet the intent of the ATS Order. This was developed by the V-22 Training Team and will eventually be spread across Marine Aviation. TCI focuses on an integrated training system and concurrency management.

Over the next several years, there will be a significant increase in the number of USMC simulators. These simulators are for pilots, enlisted aircrew and maintainers. One new effort is the Marine Common Aircrew Trainer which is being developed as a common aircrew trainer for USMC rotary wing and C-130s. This will allow the enlisted aircrew to focus on Crew Resource Management and cabin in-flight duties.

PMA-207 COMMERCIAL AIRCRAFT PROGRAM OFFICE

PMA-207 just received New Start authority ISO USMC KC-130J ISR/Weapons Mission Kit - Responding to Urgent Universal Needs Statement (UUNS) process to fill a specific, forward deployed urgent capability gap. The UUNS requested a limited long-duration ISR and CAS capability to support current combat operations in Afghanistan. The ISR/Weapons Mission Kit (AKA Harvest Hawk) will enable precision fires from existing KC-130J aircraft. The kit is rapidly reconfigurable (objective < 4 hours); reserves KC-130J's primary mission of Aerial Refueling (AR) and secondary mission of Assault Support; will provide Marine Air Ground Task Force (MAGTF) Commander persistent ISR with downlink (ROVER); Hellfire; 30mm cannon; and Standoff Precision Guided Munitions (SOPGM). With the ISR/Weapons Kit installed, the KC-130J can conduct AR if required - although the modified aircraft would be primarily tasked as a Weapons Platform.

As stated, the ISR/Weapons Kit was in response to UUNS from MARCENT (Aug 08), validated by CDI (Aug 08), and the MROC (Sep 08). The full kit required targeting ISR, 30mm cannon, Hellfire, and SOPGM - but can be utilized with ISR and any and/or all of the other systems.

Late Summer 2009 achievable with ISR & SOPGM solution.

PMA-207 continues to support the USMC acquisition & conversion of ALL KC-130T aircraft to the J-Model.

Marine Corps Tactical Unmanned Aircraft System (MCTUAS)

Recent support for Overseas Contingency MCTUAS has currently fielded six of thirteen planned RQ-7B Shadow systems to VMUs through U.S. Army contract vehicles. MCTUAS continues to make strides on increasing system reliability, maintainability, and performance with both the Army PMO and AAI."

PMA-281 JOINT MISSION PLANNING SYSTEM (JMPS) PROGRAM OFFICE

JMPS is designated as the DoN's sole aviation mission planning system and facilitates the following functions: Mission Planning, Mission Briefing, Mission Rehearsal, Data Loading to Aircraft/Weapons, and Mission Debrief.

JMPS replaces Portable Flight Planning Software and was successfully fielded to the MV-22, AV-8B, and EA-6B communities during 2008 (the F/A-18 community had already transitioned). Among several highlights during 2008, VMM-263 and VMM-162 both deployed in support of OIF utilizing JMPS! All Marine helicopters are due to transition in late 2010.

The JMPS-Expeditionary (JMPS-E) is a spin-off of JMPS and is a web-based mission planning system catered toward the crisis action planning needs of the Amphibious Ready Group. JMPS-E Developmental Test began summer 2007 aboard the USS BONHOMME RICHARD during Exercise TRIDENT WARRIOR. Additional Developmental and Operational Testing is scheduled with the 15th Marine Expeditionary Unit and Amphibious Squadron One (CPR 1) beginning September 2009. Initial Operational Capability is slated for spring 2010 and Final Operational Capability scheduled for 2012.



AIR 1.0 ACQUISITIONS

PMA-202 AIRCREW SYSTEMS PROGRAM OFFICE

PMA-202 provides the Navy and Marine Corps with cost-wise aircrew systems by developing, integrating, fielding, and supporting aircrew safety, survivability and mission enhancing core capabilities. Our Scope of Aircrew Systems include items that fall under Personal Protection, Combat Survivability, Chemical Bio Defense Protection, and Escape, Egress, Evasion & Recovery. PMA-202 has hundreds of products and actively works to meet the mission for the fleet. Here are three of many:

Flight Deck Cranial Program

Objective is to provide a Flight Deck Cranial that provides protection from jet engine noise overexposure via passive and/or active attenuation, as well as improving impact resistance, NVD & CBR component compatibility

The Aircrew Endurance (AE) Program

The bulk and weight of current survival vest and armor leads to heat stress, physical fatigue, and loss of mobility, resulting in reduced endurance. AE will identify solutions to resolve deficiencies in weight, bulk, hydration, bladder relief and universal color. The program will field upgraded armor protection, an upgraded survival vest, the aircrew mission extender device, and hydration capability. A new camouflage color will also be selected.

The Common Mobile Aircrew Restraint System (CMARS)

The CMARS will replace the existing fixed-length belt with a locking retraction system that attaches to the AIRSAVE lifting harness to improve aircrew restraints.

in draft. In addition, rewiring the intercom system (ICS) is planned for fall 2009 as part of an effort to improve ICS operation.

The CH-46E test team is currently evaluating the Aircraft Integrated Maintenance System software enhancements and an updated processor. The new features will provide real time engine health monitoring, automate cross wind hover, stick plot, and the auto-rotation. If successful, improved engine monitoring data will reduce maintenance requirements for the aircraft.

The CH-46E test team is evaluating an Infra-Red (IR) Suppression System designed to reduce the aircraft's IR signature. Phase I flight testing is planned to start in April 2009 to determine if the IR signature will be significant enough to proceed with flying qualities and engine performance data. Also in work is evaluation of changes to aircraft vulnerability from signature reduc-



CH-46E Test Team and Maintainers

CH-53 FLIGHT TEST

The H-53 test team has been supporting the fleet with several projects since the New Year. The team has completed testing on the T64-GE-416 engine upgrade on the CH-53D and the T64-GE-419 engine upgrade for the CH-53E. Both of these programs will allow the FMF to operate at greater weights at higher altitudes and temperatures. This will assist the FMF in the upcoming operations in the summer months in Afghanistan and Iraq. Additionally, the CH-53D will be undergoing a

rotor blade upgrade. The upgraded blades are the existing CH-53E blades in current use and will relieve the current CH-53D rotor blade obsolescence issue as well as provide additional lift capability. The testing for the improved rotor blades is scheduled to start in April 2009.

The team also supported the NASA Orion program with some heavy lift help. NASA Wallops was tasked to do some risk reduction testing on the recovery parachutes for the Orion Capsule. The H-53 team lifted the 20,000 lbs capsule simulator from the Wallops airfield to the test range and released it from a 2,500 foot hover. The chutes all operated as designed. That event was the precursor to the full scale mock-up test going on in April 2009.



Maj Jack Perrin and Maj Foster Carlile lifting the Orion Capsule for the Marine Air Logistics Squadron drop test 06 March 2009



Maj Jack Perrin and Maj Jonathan Morel executing tethered hover for the -419 engine test in the CH-53E 09 March 2009



Release of the 20,000 lb Marine Air Logistics Squadron test article from a 2,500 ft hover

H-1 UPGRADES FLIGHT TEST

The H-1 Upgrades, AH-1Z and UH-1Y, Integrated Mechanical Diagnostics Health and Usage Management System was designed to perform main and tail rotor track and balance, engine monitoring and diagnostics, rotor system monitoring, gearbox and drive train diagnostics and monitoring, structural usage monitoring, and exceedance monitoring. The Vibration Processor Unit in the Main Processor Unit was redesigned because of component obsolescence. The new vibration processor board is referred to as the Enhanced Vibration Processor Unit. The evaluation was completed and the data is being analyzed.

H-1 Upgrades was also tasked with evaluating the APX-123 MODE 5 for compatibility. Additionally, the team supported a high level Mode 5 Technical evaluation that consisted of multiple type/model/series aircraft and naval vessels. The UH-1Y evaluation is currently ongoing and the AH-1Z effort is upcoming.



UH-1Y "on-the-go" over the NAS Patuxent River NAWC Rotary Wing Helicopter pad departing for mast-mounted SATCOM antenna performance testing

As a component of the Integrated Avionics System, the AN/AAQ-30 Target Sight System (TSS) completed Engineering Manufacturing Development (EMD) and Operational Test IIC Phase I on the AH-1Z with numerous deficiencies. The TSS hardware and software had been modified and implemented in an attempt to correct these deficiencies. The TSS performance, overall functionality, and mission effectiveness were evaluated during multiple software loads in anticipation of a new production turret. Multiple deficiencies remain and the system software and hardware are currently under redesign for follow on evaluation. A risk reduction effort is scheduled in the coming months and a Developmental Test IIC3 test effort is scheduled later in FY09.

The UH-1Y Satellite Communication (SATCOM) system required a redesign due to a deficiency during EMD testing. The current production SATCOM antenna is located on the cabin roof under the main rotor arc. This location was not acceptable due to the copper mesh in the main rotor blades which blocked the satellite signals when the blades are in motion. The current redesign has moved the SATCOM antenna and diplexer assembly from the cabin roof to the top of the main rotor hub. An evaluation of the in-flight structural integrity and antenna performance of the SATCOM assembly was completed in FY08. The data is being analyzed prior to fleet release of the production kit. However, a second prototype system is currently on deployment with the first UH-1Y deployment.

Phase, teams from Lockheed Martin and Raytheon will be operating in a highly competitive environment in preparation for a down-select and entry into the Engineering and Manufacturing Development phase with a single contractor. Initial F/A-18E/F wind tunnel testing for both contractors is scheduled to begin in 3Q FY09. Milestone B is planned for 1Q FY11. Initial Operational Capability (IOC) for the F/A 18E/F, AH-64D, and AH-1Z is scheduled for 2016. IOC for the MH-60R and ER/MP is scheduled for 2017.

Guns and Ammo

PMA-242 Aircraft Gun Systems continues to support the Marines both forward deployed as well as those in garrison. Multiple initiatives have been taken to include supplemental procurements and increase delivery of 20mm Semi-Armor Piercing High Explosive Incendiary ammunition to support Operations ENDURING FREEDOM and IRAQI FREEDOM. The Common Defensive Weapon System, GAU-21, 50 caliber replacement weapon was designed to replace the legacy inventory of 50 caliber aviation crew served weapons. The GAU-21 is currently fielded on the CH-53D/E ramps. Integration efforts for CH-53D/E windows and UH-1Y are ongoing with expected fielding in 4Q 2009. The Guns Team will also be integrally involved with the USMC KC-130J Harvest Hawk program in weaponizing the Harvest Hawk with a 30mm gun.

Rockets

The PMA-242 Rockets Team continues to support Overseas Contingency Operations with 2.75 inch and 5-inch rockets in the Global War on Terror. This includes product improvements to enhance effectiveness and safety, such as a new penetrating warhead, an improved flechette warhead, and a more IM compliant 17-lb warhead. Additionally, the Advanced Precision Kill Weapon System (APKWS), which adds a mid-body laser seeker to unguided rockets for a precision kill capability against soft to lightly-armored/hardened targets, is currently in the Engineering and Manufacturing Development (EMD) phase. EMD is scheduled to be complete in December 2009 and the APKWS is planned for Initial Operational Capability in 1Q FY11.

PMA-263 UNMANNED AERIAL VEHICLE PROGRAM OFFICE

Navy/U.S. Marine Corps Small Tactical Unmanned Aircraft System (STUAS)/Tier II Program



Artist Rendition of Notional STUAS/TIER II

Mission

The STUAS class vehicle will provide the Marine Air-Ground Task Force Commander with a dedicated ISR asset to detect, identify, track, and target various threats. The system will be a multi-mission platform that will provide a scalable, tactical, interoperable, and integrated airborne ISR and target acquisition capability. Some of the required capabilities include; high resolution EO/IO capabilities, communications relay, and modular payload capability to support future payloads. The Tier II/Group 2 or 3 UAS is the Battalion/Regiment/Division level UAS system.

Program Status

January 2005 - MROC validated Urgent Universal Needs Statement (UUNS) and DC CD&I initiates JCIDS.

October 2006 – USMC STUAS/Tier II and USN STUAS POM-08 strategies combined by ASN(RDA) into a single program.

November 2006 - designated ACAT III.

November 2008 - JROC approved CDD.

Request for Proposal (RFP) release pending per FED-BIZOPS announcement.

Demonstration period scheduled for May – June 2009.

The STUAS will be IOC in FY12 and FOC in FY16.

56 Total system buys planned between USMC and USN.

Trainers), the Training Integration System and academic instruction devices. T-45 TS Program utilizes Contractor Logistics Support for all maintenance levels.

The T-45 aircraft is in the last year of full rate production. The older T-45A fleet is being upgraded with a Required Avionics Modernization Program to reduce obsolescence and create a single T-45C fleet. A significant simulator upgrade is also underway to create a single configuration. The retirement of the T-39 NFO radar training platform has generated a new NFO syllabus requirement to do radar training in the T-45. A Virtual Mission Training System is under development that will integrate the T-45 fleet and new ground stations via a data link with a 'virtual' multi-mode radar/electronic warfare system. Finally, the T-45 engine has a Hot Section Reliability Improvement Program development effort underway to both improve engine reliability and reduce known surge susceptibility via digital electronic control.

PROGRAM EXECUTIVE OFFICE, UNMANNED AVIATION AND STRIKE WEAPONS (PEO (U&W))

PMA-242 DEFENSE SUPPRESSION SYSTEMS PROGRAM OFFICE

Public release authorized with NAVAIR Form 5720/1 (0507) "Public Release Authorization Request", Tracking number 09-352

Precision Guided Munitions (PGMs)

Recent support for Overseas Contingency Operations has included some developments regarding the AGM-114 Hellfire family of missiles. Specifically, in addition to legacy Hellfire variants, Marines have recently received AGM-114N-5 Hellfire missiles which include trajectory shaping software that optimizes the missile's lethality against vertical structures as seen in Military Operations in Urban Terrain environments. Progress is also being made to address the integration of Hellfire on fixed wing aircraft as one portion of the USMC KC-130J Harvest Hawk program. Additionally, PMA-

242 is planning for the integration of the AGM-114R variant which will potentially streamline the Hellfire family of missiles into a single variant which will be lethal across the spectrum of Hellfire targets and launched from all DoN Hellfire capable platforms.

A contract was recently signed which will reopen a Laser Maverick Guidance and Control Section (GCS) production line. These new GCSs will be used to convert aging Infrared Maverick missiles to a more desired laser configuration which has proven to be consistently lethal and reliable in the Global War on Terrorism.

The PMA-242 PGM Team also provides sustainment support for operations and maintenance of all Hellfire, Maverick, and TOW missiles currently in the inventory.

Joint Air-to-Ground Missile (JAGM)

JAGM is a pre-Major Defense Acquisition Program, Acquisition Category-1D Army-led Joint Service program integral to both Sea Strike and Sea Shield Mission Capabilities Packages. It will be the next generation air-to-ground missile for fixed wing, rotary wing, and Unmanned Aerial Vehicle aircraft designed to replace the Hellfire, TOW-2A, and Maverick families of missiles. The JAGM is an extended range, precision-guided weapon that provides lock-on-before-launch and lock-on-after-launch with precision point target and fire-and-forget (active and passive) capabilities against both fixed and moving targets. It will be effectively employed day or night in obscured battlefield, adverse weather, and countermeasure-rich environments. A JAGM Memorandum of Understanding between the Department of the Army Program Executive Office, Missile & Space (PEO(MS)) and the Department of the Navy Program Executive Office, Unmanned Aviation & Strike Weapons (PEO(U&W)) was signed by BG Genaro Dellarocco, USA and RDML William Shannon, USN.

On 11 September 2008, two Fixed Price/Incentive Fee contracts were awarded to competing teams from Lockheed Martin and Raytheon. Raytheon is located in Tucson, AZ and has a teaming agreement with Boeing in St. Charles, MO. Lockheed Martin is located in Orlando, FL. The 27-month Technology Development (TD) phase will include a system level Preliminary Design Review, prototype missile fly-offs, and initial F/A-18E/F Flying Quality flights. During the 27-month TD

During the initial phases of developmental test, the AH-1Z was found to have susceptibility to rocket gas ingestion. The team has conducted multiple evaluations to better characterize the effects and expand the available envelope for rocket release. A recent effort was coordinated in order to reduce the outboard weapons firing station restrictions. The test effort was completed and the data is currently being analyzed.



AH-1Z conducting rocket delivery over the Eglin Air Force Base Range Complex during Rocket Gas Ingestion testing

MV-22 FLIGHT TEST

Expanding the Envelope

Some of our recent flight testing has focused on discovering the V-22's Short Takeoff and Landing (STOL) limitations over uneven surfaces. This testing is being done to determine the V-22's limitations in STOL modes to get an accurate determination of the aircraft's capabilities in various environmental conditions. Thus far, our rough field short takeoff tests have had the aircraft taxi over variable heights (1½ to 2 inches) carrying different payloads (46 to 57 thousand lbs) and moving at various speeds (5 to 60 knots). Initial testing has been done on a paved surface, where the aircraft taxis over solid aluminum blocks stacked at different heights. These sheets are exceptionally solid and nei-

ther move nor flex, providing a fixed obstacle to move over. The original theoretical model used to predict the aircraft's safe limitations under such conditions indicated we would be able to traverse a 2 in. bump at 60 knots. Current testing discovered that speculative limit was ambitious; the nose gear limitation was much lower at 25 knots.

Our next phase of testing, in order to expand our envelope, will move to more natural, less fixed surfaces. This testing will be conducted at Yuma, AZ, on various types of surfaces to assess the impact of the natural environment on the V-22 in STOL modes. The data from these and the previous tests will be uploaded into our model, giving us more accurate predictions of what the aircraft can actually withstand. Testing in the natural environment began in early December. Certainly, discovering limitations now in flight testing is important simply from a safety standpoint and will become even more valuable in determining the V-22's capabilities at higher altitudes where lower air densities are so problematic for traditional helicopters, particularly the 10,000 foot ceiling constraint. Ultimately, the testing goal is to provide the fleet with additional capabilities to meet future challenges.



An MV-22 from HX-21 charges off the deck during Short Takeoff and Landing on the Yuma, AZ training grounds in December 2008

UH-1 FLIGHT TEST

The last UH-1N at HX-21 departed in June 2008 at the completion of the last assigned flight test efforts. The last evaluation completed was the AN/AAQ-22E Night Thermal Imaging System Battle Ready Infrared Targeting Equipment (BRITE) Star Block II (NBSB II). Full Rate Production has been approved; however, the evaluation is ongoing for the UH-1Y. The NBSB II upgrades the currently fielded BRITE Star with a color Charge Coupled Device camera, 640x 512 infrared focal plane array, improved optics for increased detection, recognition and identification ranges, and integrated laser pointer.

Currently, there are no future UH-1N flight test efforts assigned to HX-21.



UH-1N hovering over the NAS Patuxent River NAWC Rotary Wing Helicopter pad prior to departing for an NBSB II developmental test flight

VH-71 FLIGHT TEST

The VH-71 Integrated Test Team (ITT) continues to conduct integrated test and evaluation of the VH-71 Executive Transport Helicopter. Using the integrated contractor/government developmental and operational testing approach, the ITT is supporting validation of the VH-71 design specifications, establishing operator limitations and procedures, and determining potential operational effectiveness and suitability in preparation for the independent Operational Test Period.

Currently, Test Vehicle (TV) 2 has begun load survey flights to establish a database of structural loads, stresses, and strains measured from the aircraft during various flight and ground conditions. After the

data is collected, the program will move forward and begin expanding the current EH-101 gross weight envelope of 14,600 kg (32,187 lbs) to the VH-71A gross weight envelope of 15,600 kg (34,392 lbs).

TV5 has completed phases 1 and 2 of an initial vibration survey. The purpose of the survey was to collect baseline vibration characteristics of a representative VH-71 and then use the collected data to optimize the Active Control of Structural Response (ACSR) system. This system is designed to actively reduce vibration within the EH-101 aircraft structure caused by normal rotor system vibrations. It continuously measures the structure's response to main rotor forces and inputs canceling forces into the structure. The data collected was processed and ACSR actuator weighting factors were changed to optimize the ACSR system for the VH-71. TV5 is currently in a modification period for installation of the on-board inert gas generating system (OBIGGS) and for the Build 2 wiring installation. Flight testing of the OBIGGS will begin when the aircraft comes out of mod at the end of April.

AgustaWestland delivered the first 3 VH-71A pilot-production (PP) vehicles to Patuxent River from Yeovil, UK via C-17. PP1 arrived in early December and was hung in the ground test rig at the Presidential Helicopter Support Facility for ground vibration tests. PP3 also arrived in December, and PP-4 arrived in February. Both PP3 and PP4 were reassembled, functional checks completed, and subsequently delivered to Lockheed Martin Systems Integration (LMSI) in Owego, NY for further avionics installation, paint, and cabin interior installation. When ground vibration testing was completed in late February, PP1 was delivered to LMSI for follow-on production. PP2 is scheduled for arrival at Patuxent River in early March. TV3 and TV4 are currently at LMSI for missionization. These test assets will return to Patuxent River in early to late spring for avionics testing.

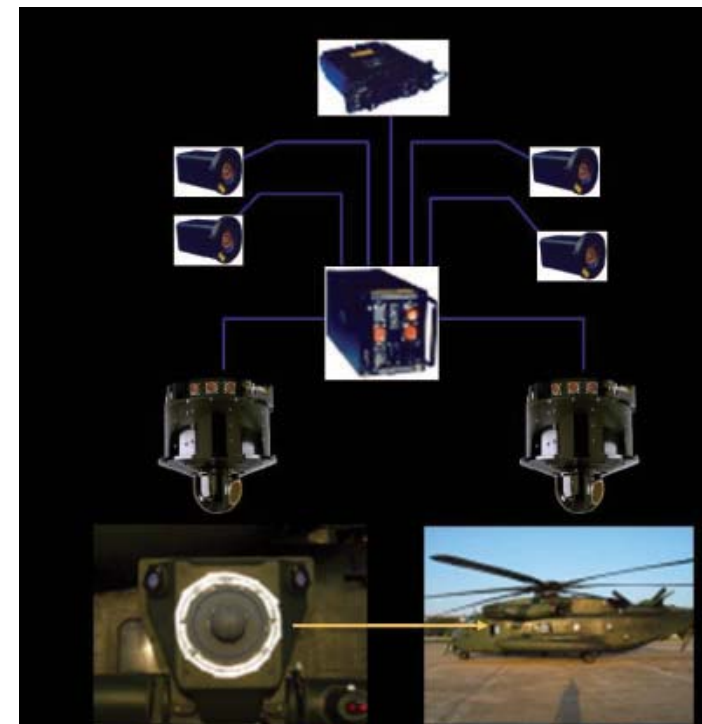


TV-2 conducting flight test at Patuxent River

JATAS is one of the first Department of Defense programs to begin under the new 5000.02, executing a full Technology Development Phase with multiple competitors, down-selecting to one winner after a proven design & performance phase. JATAS will IOC in FY14.

Department of the Navy Large Aircraft Infrared Countermeasures (DoN LAIRCM)

AAQ-24 DoN LAIRCM is an integrated Missile Warning System & Laser-based Directed Countermeasure that has been integrated & fielded within 18 months onto the CH-53E helicopter. There are follow-on integrations in works for the CH-46 & CH-53D aircraft as well. DoN LAIRCM is a tremendous example of a rapid acquisition, testing & fielding program that met the needs of the warfighter. The system employs five 2-color Infrared Missile Warning Sensors, a central processor, and 2 Laser Turrets called Guardian Laser Turret Assemblies. The system detects, identifies & jams incoming missiles with directed energy. It is a quantum leap in helicopter self-protection.



AAR-47

The AAR-47 is a 1st generation Missile Warning System (MWS), utilizing a non-imaging ultraviolet detection element. It is employed on over 1250 DoN aircraft, and 2500 aircraft worldwide. It has been updated & fielded an amazing three times since the beginning of the Global War on Terrorism, a phenomenal feat! The MWS technology has been improved to prevent dynamic blanking, and most recently, to improve Probability of Detection in clutter environments. Fielding began in November of 2008.

APR-39

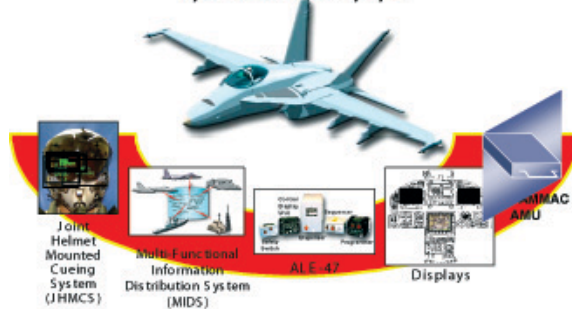
The APR-39 Radar Warning Receiver (RWR) is fielded on all Navy & Marine Corps Helicopters and some large fixed wing propeller aircraft. There are 3 versions of the APR-39 and PMA-272 is working on a 4th, the APR-39 B(V)X. This latest version will address obsolescence issues and allow the CH-53K to integrate the AAQ-24 DoN Large Aircraft Infrared Countermeasures system into the RWR display. The upgrade is taking place in 3 phases, PMA-272 is working Phase 2 right now. In addition, the program office has undertaken a business case analysis to help determine the best path to overcome a number of RWR deficiencies. The program plan to either upgrade the APR-39 or procure a new system will begin in FY12 assuming funding is secured.

PMA-273 NAVAL UNDERGRADUATE FLIGHT TRAINING SYSTEMS PROGRAM OFFICE

The T-45 Training System (TS) mission is to develop and support a carrier-capable, Naval Jet Flight Training System to provide both intermediate and advanced strike pilot and flight officer training for up to 400 students each year. Naval aviator training includes strike fighter pilots, NFOs, and E2/C2. The Program inventory requirement includes 221 carrier capable T-45 aircraft, 17 simulators (14 Operational Flight Trainers and 3 Instrument Flight

PMA-265 F/A-18 PROGRAM OFFICE

ECP-583 R2/R4 Avionics Upgrade
F/A-18A Lots 7/8/9



VMFA-115 has begun receiving the first ECP-583R2/R4 configured aircraft from Boeing-Cecil. This avionics upgrade brings essential capabilities in the way of MIDS LVT, Color Displays (MDGU), TAMMAC, JHMCS, ALE47, AMU, and NACES Ejection Seat to 56 F/A-18A (Lot 7/8/9) USMC aircraft. The Marine Corps also has plans to provide the same capability upgrade to 30 F/A-18C (Lots 10 & 11) aircraft. These programs, commonly referred to as A++ and C+, will ensure tactical relevance well into the future for the Marine Corps Hornet fleet. CNAF and PMA-265 have already begun identifying F/A-18C upgrade candidates based on flight hours, landings and fatigue life remaining and preserving them in AMARG Section 1. The OPNAV Strike Board was recently held in Tucson, AZ and HQMC-APW and PMA-265 took the opportunity to visit AMARG and check on the 17 recently preserved jets. Current plans call for 24 aircraft to be preserved at AMARG Section 1, while awaiting the C+ avionics upgrade program that is scheduled to begin in FY13.



Boeing-Cecil



F/A-18C Lots 10 & 11 - AMARG (Section 1) Tucson, AZ



LtCol John "Kit" Carson, HQMC-APW & LtCol Jim "Rooster" Rector, PMA-265

PMA-272 AIRCRAFT SURVIVABILITY PROGRAM OFFICE

Joint Allied Threat Awareness System (JATAS)

JATAS is the next generation Missile Warning System. JATAS released a Request for Proposal (RFP) in early January. JATAS combines requirements for missile warning, laser warning & hostile fire indication into one sensor and requires the development to be accomplished using open architecture. The advances in Missile Warning Set technology promise to make the JATAS sensor a significant improvement in self-protection technology.

AIR TEST AND EVALUATION SQUADRON 23 (VX-23)

EA-6B FLIGHT TEST

Improved Capability (ICAP) III Block 4

The VX-23 EA-6B team is currently gearing up for testing a major block upgrade to the Prowler. The ICAP III Block 4 program introduces hardware components that have already been installed and tested in the ICAP II Block 4 configuration. The test team here at Strike will be regression testing the Digital Flight Control System, ALE-47 Countermeasures System, CDU 900A navigation controller, new Power Trim Indicators, USQ-113(V)4, and integration of the LITENING pod. Team members will also be running regression tests on a new Tactical Display System Interface Unit that has been upgraded with more memory. Ground test is scheduled to begin mid March 2009 and last six weeks, followed by 25 hours of flight test. The ICAP III Block 4 configuration will be the first ICAP III Prowlers that the Marine Corps receives as the Navy transitions to the EA-18G. Currently plans are in work for a two-week flight test detachment to Marine Corps Air Station Cherry Point.



EA-6B Testing in the Anechoic Chamber

AN/ARN-153(V) TACAN

ICAP II Block 4 flight test of the AN/ARN-153-(V) TACAN Adaptor Mount (TACAN/TAM) combination was completed on September 23, 2008. For the most part, results were favorable. TACAN Air-to-Ground performance was typical of that seen in the EA-6B with the AN/ARN-84 TACAN. Accuracy in range and bearing was maintained both up-and-away and during the approach phase of flight. TACAN Air-to-Air performance was somewhat reduced with a maximum all-aspect range of approximately 15 nmi. Additionally, aircrew should expect to see a difference in displayed TACAN Built-in Test (BIT) Distance Measuring Equipment (DME). Where the AN/ARN-84 usually returned a value of 1.8 nmi the AN/ARN-153 consistently returned a BIT DME value of 1.7 nmi.

ICAP III flight test of the AN/ARN-153 TACAN was not executed as a result of observed Multifunctional Information Distribution System (MIDS) Electromagnetic Interference (EMI) during more comprehensive ground testing in the anechoic chamber. The resistance of the TACAN to MIDS EMI was poor as a direct result of a physical design flaw. Presently no fix has been identified for this flaw. Flight test of the AN/ARN-153 has been delayed until a fix has been identified and implemented. As a result, aircrew will not see a TACAN upgrade in ICAP III aircraft for a year or more depending on the pace of an engineering solution.

ALE-47 Counter Measures Dispensing System

ALE-47 flight test for ICAP II Block 4 aircraft concluded on May 7, 2008. Flight test of the system was, after a slight delay, successful. In all areas, the ALE-47 system performed as designed. Decoys were consistently expended in accordance with the desired program. Not a single expendable event was lost. In other words, when a program was initiated by aircrew, the ALE-47 punched out flares, period. This was a big departure and marked improvement over the ALE-39.

One area that was discovered to be particularly weak during ALE-47 flight test was documentation. Specifically, documents detailing EA-6B installation and operation were substantially incorrect or absent altogether. As a result of detailed analysis, comprehensive improvements were made to draft publications to

include NATOPS, Weapon System Operators Manual, and maintenance documents. Furthermore, an ALE-47 User Guide was developed and forwarded to EA-6B Operations Officers to facilitate training before the ALE-47 hits the fleet in ICAP II Block 4 aircraft.

At present an effort is underway to test the ALE-47 to facilitate fleet installation in ICAP III Block 4 aircraft. From a technical standpoint, the implementation should be relatively straightforward. Thus, fleet operators can expect to see the ALE-47 in ICAP III Block 4 aircraft when it finally hits the street. Reasons to want the new gear: consistent and reliable operation that will improve survivability in combat with an improved training feature to increase familiarity with the system.

F/A-18 A-D FLIGHT TEST

Planing Link Mechanism Redesign

As all Hornet pilots know, planing link failures on touchdown are one of the few emergencies in the Hornet that require immediate action in order to avoid a mishap. Since the Hornet began flying, aircraft have experienced damage from incidents attributed to failed main landing gear (MLG) planing and connecting links. "Planing" is the action of rotating the MLG wheel from an off-axis, folded position in the wheel well to an extended position in-axis with the aircraft in preparation for touchdown. The planing and connecting links are susceptible to failure from high compressive loads which buckle the links and prevent full travel of the planing mechanism. The unplanned MLG can cause the dreaded sharp swerve after touchdown characteristic of a planing link failure.

The original "Bellville" planing link, which looked more like the current connecting link, was very susceptible to buckling. A huge improvement came with the "coiled spring" planing link (retrofit in 1992 to all Hornets) which greatly reduced the number of failures, but did not eliminate them. Due to continued failures, an International Landing Gear Action Team (US Navy, Boeing, Canada Forces, and Finish Air Force) was formulated in 2003 to readdress the issue. A new design was agreed upon and the Canadian Forces have finished initial flight testing at their test facility in Cold Lake,

Alberta, Canada. The results were very favorable and NAVAIRSYSCOM will begin flight testing in April 2009 on the new planing mechanism, extensively evaluating the new assembly in the carrier environment. If test results are as predicted, Hornets will begin retrofit by 2010 and significantly reduce the likelihood of this serious emergency.

Electrical System In-flight Performance Survey

The Hornet's Generator Converter Units, better known as GENs, continue to exhibit significant reliability issues and are at the top of the list for maintenance and repair costs along with being a substantial readiness degrader. To date, there have been no prominent or consistent root causes identified for their failure, either through failure analysis or flight test....**until now!** Utilizing a fully instrumented electrical system, flight test is being performed from the edges to the heart of the flight envelope to find specific aircraft flight conditions that may cause anomalies in electrical system performance. These anomalies will give clues to conditions that could lead to failures in the GENs over time. The data obtained from this testing will hopefully lead to engineering fixes that will greatly improve the reliability of the GENs. Although the topic of electrical systems is not inherently sexy, these flight tests may provide data to make a dramatic improvement to Hornet readiness in the fleet.

Multifunctional Information Distribution System (MIDS)

The MIDS team continues to support the MIDS Low Volume Terminal (LVT) program, recently completing a series of flights to record the Radio Frequency signal during TACAN approaches. The primary focus was to assist the vendors with finding a solution to a TACAN performance anomaly noted during the developmental test of the MIDS BU-1 LVT. It was during this phase of testing that it was discovered, under certain conditions, the TACAN needle in the Head-Up Display would become unreliable. Additionally, multiple test pilots returning from the fleet, verified that TACAN performance around the boat was deficient. Some of the deficiencies included bearing wanders and no TACAN information while in the marshal stack. As a response to this new information, the MIDS team returned to the boat to verify these deficiencies. A specially designed

Engine Sustainment

- Performance Based Logistics Development

Maintaining Warfighter Relevance

- H4.0/H5.0/H6.0 Block Upgrades
- LITENING Targeting Pod Upgrades
- LITENING Pod Carriage on Station 4 (Centerline)
- Digital Improved Triple Ejector Rack (BRU-70) Development
- Joint Interoperability for Digital Closed Air Support

Communications

- Integration of Dual Mode Laser Guide Bomb (GBU-127F/B) and Laser Joint Direct Attack Munitions (GBU-54)

Supply Support

- Rolls-Royce, Goodrich, Boeing, BAE, Naval Inventory Control Point, Defense Logistics Agency, Fleet Readiness Center



AV-8B Dual Mode Laser Guide Bomb (GBU-12F/B) Testing

PMA-260 AVIATION SUPPORT EQUIPMENT PROGRAM OFFICE

Reconfigurable Transportable Consolidated Automated Support System (RTCASS) is an Engineering Change Proposal to Mainframe CASS (ACAT II Program), and is currently Post Milestone C. It is a downsized and readily transportable version of RF/HYBRID Consolidated Automated Support System (CASS) that better meets the expeditionary requirements of the USMC and Air Force Special Operations Command (AFSOC). The program completed Follow On Test & Evaluation on 10 Mar 09 and is awaiting the formal Test Report from Commander Operational Test Forces in order to proceed to Initial Operational Capability (30 Apr 09). RTCASS is in Full Rate Production and is currently exercising the last Option of a six-year production contract. The current Acquisition Objective for RTCASS is 160 stations for the USMC, 12 stations for AFSOC, and 4 stations for Foreign Military Sales.

RTCASS is the next generation of Automatic Test Systems for the Marine Aviation Logistics Squadrons Intermediate Level Maintenance Activities. It will replace a myriad of Mainframe CASS models and legacy Automatic Test Systems that are technologically obsolete and are becoming far too costly to repair and maintain. It will provide fault isolation and fault diagnostics for repair of DoD electronic and avionics weapon system at the system, sub-system and component level on F/A-18, EA-6B, AV-8B, and V-22 aircraft. RTCASS is comprised of 11 enclosures, each weighing no more than 150 pounds (man-portable) and can be deployed on two 463L Pallets (deployable). It must emulate CASS to prevent costly redevelopment of over 600 Test Program Sets. The Fielding Profile allows for concurrent CASS and RTCASS operation, and phased removal of CASS stations.

Component hardware is presently under investigation for inclusion in the Spiral 2 effort. We are working on completing System Requirements Review action items.

Collaborative Online Reconnaissance Provider Operationally Responsive Attack Link (CORPORAL)

Transition Manager representatives are meeting with USMC programmatic representatives at the Marine Corps Combat Development Command in conjunction with a Marine Air Group Operational Advisory Group to socialize the CORPORAL capability and impacts to Targeted Transition Programs of Record at Marine Corps Systems Command. We're meeting with Operational Manager Integrated Product Team (IPT) in March at Naval Surface Warfare Center Dahlgren to discuss Conduct of Operations and Assessment.



PMA-257 AV-8B PROGRAM OFFICE

AV-8B Mission - AV-8B Vertical/Short Takeoff and Landing Light-Attack Aircraft supports the Marine Air-Ground Task Force Commander by destroying or defeating surface targets and escorts friendly aircraft, day or night, under all weather conditions during expeditionary, joint or combined operations. The AV-8B Harrier provides Coalition Forces with 24-hour Precision Strike, Close Air Support, Armed and Aerial Reconnaissance assets during the day, night and adverse weather conditions. Harriers have been extremely impressive with noteworthy performance in support of the Global War on Terrorism (GWOT) as

shown in both Iraq and Afghanistan. Harriers embark on amphibious ships and have been shore-based in support of the GWOT and have suffered zero combat losses or aircraft damage by enemy fire.



AV-8B Laser JDAM (GBU-54) Testing

AV-8B Focus - The AV-8B Program Office is committed to ensuring that the Harrier is sustained and remains tactically relevant as the Short Takeoff Vertical Landing close air support/offensive air support platform (40% of USMC TACAIR) until being fully replaced by the Joint Strike Fighter in 2021. The program will accomplish this by being proactive in:

- Mitigating Safety Issues
- Aggressively Pursuing Capability Improvements
- Preemptive Obsolescence Management
- Meeting Readiness Goals
- Providing Concurrent Training Devices
- Stabilizing the Supply Chain
- Reducing Costs

AV-8B is a Post-Production Program (formerly ACAT-1C), and includes a 4-nation Cooperative Program (US/UK/SP/IT) within the AV-8B Joint Program Office.

PMA-257 Top Management Programs

Sustainment of Fleet Assets

- Day Attack Upgrade (Attrition Recovery)
- Crash Damaged Aircraft Repair
- Integrated Maintenance Plan
- TA-V-8B Upgrades
- Safety and Obsolescence Upgrades

instrumentation package was installed in the aircraft to collect raw data that would allow both MIDS LVT vendors (ViaSat and DLS) to implement a fix to the problem. The MIDS team is pleased to announce that the new software implementation will be tested in February 2009 at NAS Patuxent River.

The team is still working hard to fix all software anomalies observed during early Developmental Test for the upgraded MIDS Joint Tactical Radio System (MIDS-JTRS). As with all systems under development, a few anomalies were noted with the latest software. The team is waiting for the new software release to continue testing. MIDS-JTRS is a software defined radio that is scheduled to replace the existing MIDS terminals in the F/A-18 community (LOT 26 and later). Although the concept of a software defined radio is new to the F/A-18 community, MIDS-JTRS is expected to perform similar to the traditional MIDS terminal.

Joint Service Aircrew Mask (JSAM)

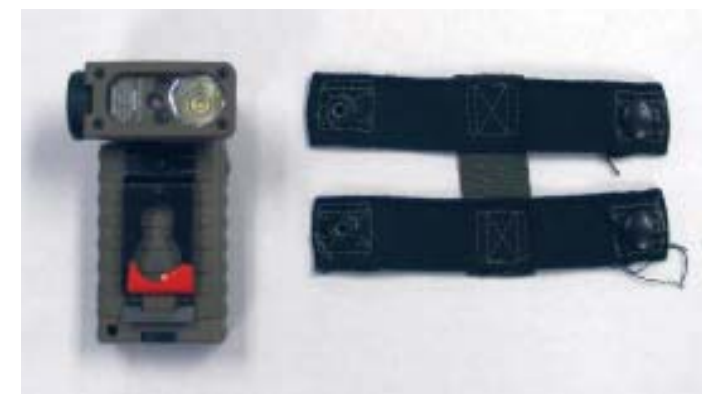
The JSAM should replace the current chemical/biological protective mask used in the fleet (AR 5). The JSAM will allow the fleet to fly with Night Vision Goggles as well as with Joint Helmet Mounted Display. First lab test occurred in March 2008 and on-aircraft testing began in June 2008. Based on the recent testing, two deficiencies were identified and fixes are currently being incorporated in a "Mark III" version of the mask. We expect to resume testing by the end of February 2009. A picture of the JSAM is shown below.



Original and Current Versions of the Joint Service Aircrew Mask (JSAM)

Streamlight Sidewinder Tactical Flashlight

The current standard flashlights, MX-991/U Right Angle "D" Cell and Cyclone Flashlights, used in the fleet for night operations are being discontinued by their manufacturers. The Streamlight Sidewinder Tactical Flashlight is intended to be a replacement. The Streamlight has four different light emitting diodes (LEDs): white, blue, green, and infrared. All four LEDs are capable of four different intensity levels and a strobe function. The flashlight has an articulating 185 degree rotating head and is powered by two "AA" batteries. The Sidewinder Flashlight and retainer are shown below.



Streamlight Sidewinder Tactical Flashlight

VX-23 aircrew evaluated the Streamlight Sidewinder Tactical Flashlight during 12 flights totaling 19.7 hours; 15.1 hours were flown on the F/A-18B/C/D, and 4.6 hours on the F/A-18F. Overall the Streamlight Sidewinder Tactical Flashlight was satisfactory for F/A-18 operations. The simple and intuitive steps required to change the light source and light intensity will allow aircrew to easily operate the flashlight under any light condition. Additionally, the illumination provided by the white light was much better than the illumination provided by previous flashlights making pre-flight and in-flight inspections of the aircraft much easier. Unfortunately, the extremely bright green and blue lights, even in the dimmest setting, could disrupt night vision sensitivity and force aircrew to use alternate light sources to illuminate kneeboards and approach plates during night flights. Despite these deficiencies the Streamlight Sidewinder Tactical Flashlight is suitable for F/A-18 operations and was considered by most aircrew to be better than the current flashlights.

BRU-55

F/A-18A-D can expect BRU-55 racks to begin delivery this spring and be available for operation under the existing December 2007 flight clearance. Captive carriage tests have been completed on the redesigned 1760 cables with good results, and a limited flight separation evaluation is scheduled to be conducted with the redesigned cables this spring. F/A-18A-D fleet users can expect to see new redesigned cables cleared for fleet use in FY10. F/A-18E/F BRU-55 developmental flight testing continued when successful captive carriage tests were completed on the redesigned 1760 cables in October 2008 and a limited flight separation evaluation is scheduled to be conducted with the redesigned cables this Spring. The BRU-55 racks should be ready for Operational Test by summer of 2009 and we expect fleet release of the F/A-18E/F BRU-55 capability in FY10.

GBU-54 Laser JDAM

The GBU-54 configures a 500 lb bomb body with a modification kit similar to GBU-38 kit including the addition of a DSU-38/B Laser Detector to allow a dual-mode option for release and targeting of stationary and moving targets. The GBU-54 Initial Operational Capability was achieved on the F/A-18A-D aircraft with the release of the GBU-54 flight clearance in October 2008. The F/A-18A-D served as the threshold aircraft for the Rapid Deployment Capability (RDC) process to address the Direct Attack Moving Target Capability for Navy aircraft. GBU 54 captive carriage and safe separation flight testing was completed on the F/A-18A-D in October of 2008.

The F/A-18E/F was designated an objective aircraft for the RDC process and subsequent GBU-54 captive carriage and safe separation testing was successfully completed in February of 2009. Currently, an initial flight clearance is expected to be released by the summer of 2009 for the F/A-18E/F.

F-35 FLIGHT TEST

Flight testing for the F-35 Lightning II program is underway, with a total of 72 flights logged by AA-1, the first conventional takeoff and landing F-35A, and 14 flights by BF-1, the first short takeoff/vertical landing (STOVL) F-35B.

In January, Lockheed Martin rolled out the first Lightning II equipped with mission systems, BF-4, a milestone that will lead to the first avionics testing on board an F-35. Its first flight is expected this summer. The mission systems suite will enable the aircraft to detect, locate, identify, track and target adversaries from long ranges; detect fast-moving incoming threats such as missiles; and receive and transmit large amounts of battle-space information through secure data links. The onboard sensors and data links will be integral to providing the warfighter in the air and on the ground a fused picture of the battle space.



AA-1 Weapon Bay Doors Open

The F-35 program is entering an accelerated year of flight test, with BF-1 expected to achieve the first vertical landing in the middle of 2009. BF-1 will concentrate on initial STOVL flight operations such as short takeoffs, hovers and vertical landings, and will conduct ship-suitability and gun-integration testing.

The second F-35B, known as BF-2 achieved its first flight on 25 Feb 09. BF-2 will remain in Fort Worth for several months to conduct a series of ground-test

ICAP III - ICAP III Technical Summit will be held March 3, 2009 at Northrop Grumman Corporation, Bethpage, NY.

Developmental Test (DT) - Planning for MR-10 test is underway and test will begin and complete during the summer of 2009. The sole ICAP II test asset is scheduled to undergo a Planned Maintenance Interval assessment inspection in April to determine if the aircraft can continue to be used by VX-23 during the test period. If it cannot, a loaner aircraft will be made available by Commander VAQ Wing Pacific to cover the test period requirements. ICAP III Block 3 was completed in May 2008 and the only "out-of-block" testing still remaining is for the ARN-153 TACAN. The assessment of changes required for the 153 to install in ICAP III is not complete and use for the new TACAN is not currently planned for ICAP III Block 4 test. Electromagnetic Interference (EMI) issues arose as part of VX-23 EMI test with ICAP III and Multifunctional Information Distribution System (MIDS). The updated ARN-84 the fleet currently flies has met all MIDS compatibility requirements to date. KD-02 is undergoing a Planned Maintenance Interval 1 (PMI-1) at FRC-SE with a concurrent ICAP III Block 4 install and will deliver to the fleet in 4th quarter FY-09 as an additional ICAP III Fleet asset. It will no longer be a test asset at VX-23. KD-02 was the second aircraft configured as an ICAP III aircraft. DT for ICAP III Block 4 will begin late February FY-09. KD-01 (159909) returned to Patuxent River after its PMI-1 and upgrade to the ICAP III Block 4 configuration. It should complete test in late May/early June 2009 with follow-on Operational Test at China Lake, CA. KD-01 is the only ICAP III to be in the Block 4 configuration until after test is complete. An ICAP III Block 4 Test Readiness Review was successfully conducted 17 February at Patuxent River as an assessment of the readiness of DT to start test.

Operational Test (OT) - Formal OT for both ICAP II Block 4 and ICAP III Block 3 are complete. The OT reports for ICAP II Block 4 and ICAP III Block 3 have been formally signed by Commander Operational Testing Forces and both were identified as "Operationally Effective/Operationally Suitable." Minor issues from ICAP III Block 3 test with MIDS/Low Volume Terminal are being addressed in Block 4. Joint Mission Planning System for ICAP III Block 3 was "Not Operationally Effective/Not Operationally Suitable," with deficiencies from the ICAP II Block 3 OT uncorrected and carried into the ICAP III test period. ICAP II MR-10 will have

very limited VX-9 participation (no formal OT) so no aircraft requirements are necessary. ICAP III Block 4 testing at China Lake is anticipated to begin 3rd quarter FY-09, with KD-01 as the sole remaining ICAP III test aircraft.

Next Generation Jammer (NGJ) - On February 19th, Mr. Young (Under Secretary of Defense (Acquisition Technology and Logistics)) signed the NGJ Acquisition Decision Memorandum formally authorizing the beginning of the Materiel Solution Analysis phase. The team is now very busy managing the four NGJ Trade Studies being conducted by ITT/Boeing, BAE, Raytheon, and Northrop Grumman. Along with the ongoing NGJ Analysis of Alternatives, the results of these trade studies will help define what capabilities, system concepts and demonstrations will be required for the Technology Maturation and Technology Demonstration contracts to be awarded in FY10 and FY11, respectively. Technical Coordination Meetings will be held the first two weeks in March to review the progress of the studies which will be completed in July of this year. The NGJ team is also building the program and contracts documentation required prior to release of the Technology Maturation Request for Proposals this Fall.

ALE-43 Chaff Cutter and Dispensing Electronic Attack System - Pod 102 has been inducted into Depot rework. 102 will be utilized to establish the workload standard. Mas Components has provided a working Rough Order of Magnitude for an engineering documentation investigation into archive repository. Fielded Systems Team (FST) has compiled a study plan for engineering investigation of F/A-18E/F/G feasibility to support the N88 Program Objective Memorandum-12 input to be executed upon funding identification. Logistics lead conducted a site visit to Letterkenny Army Depot on 11-12 February 2009 to survey potential replacement containers with several candidate containers identified. Anticipate transfer of at least one representative container to FST for Fit Checks and potential certification for use.

Intrepid Tiger (IT) Pod - A Technology Demo from Digital Receiver Technology was conducted in Germantown, Maryland on 26 February 09. A Spiral 1 pod is being presented for Association of Old Crows Capital Hill Day presentation in support of APW-41.

PROGRAM EXECUTIVE OFFICE, TACTICAL AIR- CRAFT PROGRAMS (PEO(T))

PMA-213 NAVAL AIR TRAFFIC MANAGEMENT SYSTEMS PROGRAM OFFICE

PEO (T), Tactical Aircraft Programs, PMA-213 Naval Air Traffic Management Systems is charged with cradle to grave support of all Marine Corps and Navy Air Traffic Control (ATC) Systems and equipment as well as Combat Identification (CID). The PMA is divided into three level one Integrated Product Teams (IPTs). They are: PMA-213B ATC Systems, PMA-213C CID and PMA-213D Joint Precision Approach and Landing System. There are currently three Marines assigned at PMA-213, a Level 1 IPT lead in PMA-213B, a Marine Liaison Officer charged with participating in all items of interest to the Marine Corps and a Marine Liaison assigned specifically to PMA-213B. Each of the IPTs provide varying degrees of support to Marine Corps Aviation with the majority residing in PMA-213B ATC Systems.

The ATC Systems IPT is charged with the equipage and support of The Marine Corps' Expeditionary ATC Detachments of the Marine Air Control Squadrons, all Marine Corps and Navy Air Stations and Facilities and all CV and LH class ships. There are 41 distinct systems including: Surveillance and Precision Approach Radar, Command Control and Communications, Navigational Aids systems and associated ancillary equipment. The IPT is currently engaged in management of systems in various phases of their life cycle from development to sustainment and disposal. Programs in production include National Airspace Modernization (NAS Mod) a Joint Acquisition Category (ACAT) IC, Air Traffic Navigation and Integration System (ATNAV-ICS) a cooperative (with the US Army) ACT IV T Joint and an the AN/TRN-47 TACAN an Abbreviated Acquisition Program in response to an urgent Statement of Need originated in the Combat Theaters.

NAS Mod is a joint DoD/FAA program for modernizing ATC systems throughout the United States. The DoN is responsible for providing all ATC services on and around all air stations, facilities and ranges/training areas. Efficient and effective services are crucial

to retaining military control and, hence, access to the airspace associated with these activities.

The ATNAVICS program, in coordination with the Army, is producing and deploying an Expeditionary HMMWV-mounted package containing; Surveillance and Precision Approach Radars and the associated Command Control and Communications Systems. These systems are currently deploying to the operating theaters through out the world.

The AN/TRN-47 TACAN is a light weight man portable system capable of providing IFR navigations information down to standard TACAN weather minimums of 1 mile visibility and 1000 foot ceiling. These systems are employed by Marine Air Traffic Control Mobile Teams.

There are numerous systems in various stages of sustainment and modernization that are employed in the expeditionary role, ashore at stations/facilities and afloat.

PMA-234 EA-6B PROGRAM OFFICE

Improved Capability (ICAP) II Block 3 - Currently 51 aircraft have been upgraded to Block 3 configuration with 5 aircraft in work and 1 additional aircraft slated to be updated in FY09.

ICAP II Block 3D - The Block 3D configuration upgrade is progressing well with 45 completed to date, 10 currently in work at Fleet Readiness Center South East (FRC-SE), Contractor Field Team Whidbey, and Cherry Point. An additional 16 aircraft are projected for upgrade in FY09/10.

ICAP II Block 4 - AFC-860 ALE-47 installs are scheduled to begin in February 2009.

TACAN Adaptor Mount (TAM) - AFC-861 - EA-6B RT 1022/ARN-84 TACAN Receiver Transmitter replacement (Work Unit Code 713C100) in draft. Verification planned for Feb/Mar 2009. TAM Physical Configuration Audit completed at FRC-SE Jacksonville, Florida on 25 September 2008. Functional Configuration Audit completed 11 February 2009 at Pt. Mugu Lab. Deliveries are to begin at the end of February 2009 to Consolidated Kit Authority, Jacksonville, FL.

events, instrumentation calibrations, and airworthiness flights, including STOVL-mode operation. BF-2 is the primary flutter aircraft and will lead the envelope expansion effort for the F-35B.

2009 will also see the Navy pitch into the flight test fight! The first carrier variant of the F-35 family is due to roll off the assembly plant floor this spring. After completing initial ground testing, CF-1 will take to the skies for its first flight in the Fall. Some unique challenges will be faced with the F-35C that have not yet been seen in the other Lightning II variants. The wingspan is larger to reduce approach speeds for carrier operations and thus requires larger control surfaces. To move these larger control surfaces requires more hydraulic power supplied by larger electro-hydraulic actuators. Additionally, the larger wings introduce further challenges by requiring a wing fold mechanism and the addition of ailerons and flaps vice flaperons. The larger size of the aircraft brings many added performance benefits including increased range and endurance.



BF-2 First Flight

Plans are already in place to begin carrier suitability testing shortly after the jet arrives at NAS Patuxent River in 2010. Steam ingestion, Jet Blast Deflector (JBD) compatibility, and arresting wire roll in testing will be completed at NAES Lakehurst, NJ prior to initial catapult and trap testing at the facilities here at Patuxent River. According to the current flight test schedule, the Lightning II will be hook down for initial sea trials in 2011.

T-45 FLIGHT TEST

Greetings from the T-45 Project Team! The past year was busy for Goshawk flight test as we completed the majority of testing on the F405-RR-402 Hot Section Reliability Improvement Program engine. We hope to conclude its testing in the coming year while working on several other projects which will result in improvements being delivered to the Fleet.

Hot Section Reliability Improvement Program (HSRIP)

HSRIP is a new Rolls Royce engine that retains the fan section from the current F405-RR-401 engine, while replacing the hot section and adding a full authority digital engine control (FADEC). The FADEC incorporates logic into the engine to provide for automatic surge/stall detection and clearing. Completing flight test of the HSRIP engine has been the T-45 Project Team's primary focus. Recent testing has consisted of airstarts, surge boundary testing, forward and aft center of gravity testing, bolter and waveoff performance, high angle of attack testing and engine response during operational maneuvers. The test team's confidence in engine reliability during up and away flight continues to grow. Upcoming testing will consist of more operational maneuvers and carrier suitability testing both here at Patuxent River and at sea.



Aircraft 201 with HSRIP configuration flying a Simulated Flame Out (SFO) approach over Patuxent River. As part of risk mitigation for the new engine testing, the test team flies SFO approaches during each test flight.

Digital Video Recorder Processor (DVRP)

The DVRP is a new solid state digital video recorder that will replace the current 8mm tape recording system and later be integrated into the Virtual Mission Training System. In place of the 8mm tape is a solid state Removable Memory Module. DVRP is designed to provide high quality digital video and audio recorded from any of the 4 displays or the Head-Up Display (HUD). Additionally, DVRP records aircraft 1553 bus data which can be utilized for maintenance. Flight test of the system recently culminated with a DVRP installed aircraft flying carrier suitability catapults and traps here at Patuxent River.

T-45C Required Avionic Modernization Program Operational Flight Trainer

A new T-45C training simulator to be installed at NAS Kingsville, TX, has been in development for the Navy. At the request of NAWCTSD, our T-45 Project Team recently completed a limited scope qualitative evaluation of the simulator at the contractor's site in Florida prior to it being shipped. We will be conducting a more thorough evaluation of the simulator as part of the Government Final Inspection after it is fully installed in Kingsville. The new simulator will help train future Naval Aviators for years to come.

Upcoming Events

Light Emitting Diodes (LED) Anti-collision Light. A new LED anti-collision light is being developed for the T-45. The light will provide longer life and less maintenance as compared to the current light. Additionally, the LED light will not fade over time. Flight testing of the LED anti-collision light is expected in Spring 2009 and will include night formation flights.

HUD Waterline Change. The current HUD pitch ladder and waterline implementation by the Multi-Display Processor (MDP) does not provide adequate situational awareness to the pilot in situations where velocity vector is HUD limited. A new MDP Operational Flight Program is being developed to correct this problem and will be flight tested in 2009.

Virtual Mission Training System (VMTS). With the arrival of T-45 aircraft in Pensacola and the retiring of the T-39, the Goshawk looks to expand its training capabilities. The VMTS will provide a simulated air-to-air or air-to-ground radar in conjunction with F/A-18-like Hands-On-Stick-and-Throttle (HOTAS) controllers. VMTS can use onboard, self-generated targets or be a member of a larger data link network. VMTS incorporation will allow T-45 aircraft to conduct basic radar intercept, radar navigation, and all-weather strike training flights. VMTS will initially be integrated for rear cockpit NFO training only; however, in the future, the front cockpit will be modified with HOTAS and be fully integrated for student pilot training. VMTS development continues to progress with flight test scheduled to begin in late 2009 or early 2010.

Embedded Terrain Avoidance and Warning System (eTAWS). Flight test of the eTAWS as integrated with the T-45 is scheduled to begin early next summer. eTAWS will provide a robust terrain avoidance system which will integrate Air Data, Inertial Navigation System, Global Positioning System and digital terrain information to provide predictive terrain avoidance warnings. This system is similar to what is currently integrated into several fleet aircraft.

Universal Avionics Recorder. The USN increases longevity of military platforms by upgrading key subsystems and components. Download of flight data has always been a time consuming operation requiring the participation of ground crew. At present, this data is transferred over wired connections that a maintenance crew member must set up and operate. A proposal has been made that will provide an advanced, digital video/audio/data Universal Avionics Recorder (UAR) that combines all of the capabilities of the current Airborne Data Recorder (ADR) and Mission Data Loader (MDL) and adds new capabilities not available on the T-45. In particular, the UAR will combine the functionality of the existing ADR, Advanced Signal Data Computer (ASDC), Signal Data Computer, Digital Video Recorder, and MDL into one unit while also supporting the eTAWS. The new UAR will replace sound recorders as well as add video recording capabilities and will provide component solution replacing the existing ADR, Air Data Computer, ASDC, and MDL.



An MV-22 Osprey from Marine Medium Tiltrotor Squadron (VMM) 263 lands aboard the multi-purpose amphibious assault ship USS Iwo Jima (LHD 7). Iwo Jima was participating in Joint Task Force Exercise 08-4 as part of the Iwo Jima Expeditionary Strike Group. VMM-263 is scheduled to deploy as the Aviation Combat Element for the 22nd Marine Expeditionary Unit (MEU) next spring. It will be the first time an Osprey squadron has deployed as the Aviation Combat Element for a MEU. The operational MV squadrons' shipboard training operations have provided considerable data to effectively accommodate MV-22's aboard the Navy's amphibious assault ships. VMM 263's first deployment will add to that data base and enhance the Naval Air System Command's ability to resolve issues through continuous testing and development. (USN Photo by MC3 Michael Starkley)

PMA-276 LIGHT/ATTACK HELICOPTER PROGRAM OFFICE

UH-1Y

The UH-1Y Huey is now underway on its first operational deployment with the 13th Marine Expeditionary Unit aboard the USS Boxer.

Three UH-1Y helicopters along with six pilots and six crew chiefs set sail recently on the first Marine Expeditionary Unit deployment with a new type/model/series UH-1 aircraft since 1972.

After years of planning by Marine Corps and NAVAIR program officials and over a year of training and pre-deployment workups, the UH-1Y is ready to enter the combat zone. This first deployment of the Yankee is validation of the commitment and hard work of the entire H-1 Team. This event took years of effort from thousands of dedicated professionals at every level.

The UH-1Y team achieved Initial Operational Capability on August 8, 2008 by demonstrating that the aircraft had met all flight requirements and that the aircraft,

pilots and air crew are ready for deployment. There is a significant increase in capability, safety and performance over the UH-1N that the Marines are currently using in combat. The UH-1Y provides significant increases in range, payload, speed, ballistic tolerance and crash survivability, maintainability and deployability, with reductions in life-cycle costs and the aircraft's logistics footprint.

Part of the H-1 Upgrades program, the UH-1Y will replace the currently fielded UH-1N to help meet the Marine Corps' 21st century mission for rotary-wing utility and attack aircraft. The total program requirement for the UH-1Y is 123 helicopters with delivery expected to be complete by the end of fiscal 2016.

H-1 Upgrade Delivery

Bell Helicopter, a Textron Inc. company, delivered two more H-1 aircraft to the U.S. Marines in July. Including these two aircraft, a total of eight H-1 aircraft have been received this year – three AH-1Z attack helicopters and five UH-1Y utility helicopters. All eight aircraft are part of the USMC's H-1 Upgrade program. Final assembly of the helicopters was completed at Bell's Military Aircraft Assembly Center in Amarillo, Texas. Both aircraft departed Bell's Amarillo facility on July 10 and were ferried to Camp Pendleton, California.

The UH-1Y delivered this month was an all-new aircraft – the second all-new UH-1Y to be delivered this year. The first all-new UH-1Y was delivered on June 4, marking the first time in 30 years that the Marine Corps has taken delivery of an all-new Huey aircraft.

The current contract is to produce 34 upgraded H-1 aircraft: eight AH-1Z attack aircraft and 26 UH-1Y utility aircraft. So far, 18 upgraded H-1 helicopters have been delivered. A full-rate production decision for the UH-1Y is expected later this year. The H-1 Upgrade Program calls for a total of 100 UH-1Y and 180 AH-1Z aircraft.

PMA-275 V-22 JOINT PROGRAM OFFICE

Engine Air Particle Separator (EAPS)

One significant issue under work is to resolve concerns with the V-22 EAPS, especially the system's hydraulically powered blowers. The EAPS system's blowers have had a history of failures that caused hydraulic supply lines to rupture, resulting in lower nacelle fires, three of which resulted in catastrophic aircraft damage. The immediate action was to restrict EAPS operation; an unsatisfactory condition due to the fact that turning off EAPS leads to accelerated engine wear and prohibits entry into icing conditions. A burdensome periodic inspection of the blowers for freeplay was then incorporated to allow for EAPS operation.

The next steps targeted hydraulic system modifications that allowed EAPS operation by mitigating the consequences of a blower failure. Those modifications included the incorporation of new sensors and software that recognizes leak conditions and commands shutdown of the EAPS. Additionally, a faster acting control valve, stronger hydraulic lines and improved drainage were incorporated into the design change. These modifications have been completed on all fleet operational aircraft. Thus far, there has not been a recurrence of fires in the lower nacelle.

Meanwhile, Naval Air Systems Command worked with Bell Boeing to evaluate the causal factor chain of the blower failure and discovered that debris from the impeller shaft splines was deposited in the journal bearing. This caused impeller instability and contact with the blower housing. The resulting vibrations ultimately led to the hydraulic line ruptures. An interim improved blower with a harder shaft and more robust journal bearing has been developed in parallel with conducting characterization flight test to define the operating environment and determine the cause of spline wear. During the Characterization Flight Tests, blower over-speed conditions and related return line pressure surges both in airplane mode and during the door opening sequence in Vertical Short Take-Off and Landing mode were encountered. Flight test of a prototype solution that promises to eliminate the over-speed phenomenon is now in preparation. Meanwhile,

other alternatives to eliminating over-speeds are being developed. Finally, an industry trade study was conducted that examined solutions to eliminate the risk of hydraulic fluid fire altogether. This trade study considered both a non-hydraulic EAPS and rerouting the hydraulic lines completely outside of the nacelles. An electrically powered EAPS was technically most appealing and is being further refined for program office consideration.

All Quadrant Gun

A lot of interest has been generated around the program office concerning the all-quadrant gun. The all-quadrant 7.62mm Gatling gun, manufactured by British Aerospace, will be sent out for installation once the system finishes developmental testing (DT) at Special Operations Command (SOCOM) and gets qualified. At this point, those tests have not been completed. Once DT is completed, the system will undergo an operational testing (OT) phase for additional qualification. While SOCOM is conducting DT, the Air Force and Marine Corps will carry out service unique OT for their respective platforms.



All Quadrant Gun

U.S. Naval Test Pilot School (TPS)

Marines at TPS train to support the fleet through developmental and operational flight test and evaluation, and by providing a means for Marines with recent fleet experience to keep TPS, NAVAIR, and test squadrons informed on current fleet issues. TPS conducts two ten-month courses a year, with several Marine aviators from all Type/Model/Series in each class. The board-selected Marines' professionalism, experience and work ethic equip them to excel in the course, in which they study and apply classic flight test disciplines including flying qualities, performance, and system testing. Students fly at least 15 different aircraft at Patuxent River and around the world. On a recent field trip, Class 135 fixed-wing students traveled to Lake Meade to fly seaplanes, Edwards AFB to fly the F-16 and gliders, Boeing in Seattle for 777 simulators, and toured NASA in Houston. The rotor-wing students visited Boscombe Down in England to fly the Lynx, CH-47 Chinook, and Gazelle helicopters. On return to Patuxent River, TPS brought in several aircraft for the students to evaluate, including the MiG-15, T-28 Trojan, S-55, UH-1 Huey and CH-53D. Skills developed at TPS enable Marines to support the fleet through Research Development Test and Evaluation and to address fleet concerns on technical issues.

Recent Marine graduates of Class 134 (Major John Ohman and Major Foster Carlile) are project officers in the air test and evaluation squadrons, where their leadership and experience is already impacting USMC acquisitions. Meanwhile, a more seasoned graduate, Lieutenant Colonel Roger Cordell (Class 118), will lead TPS when he assumes command in the spring of 2009. Two more Marine TPS graduates will take command at VX-23 and VX-20 in the coming year.

TPS is actively seeking qualified and motivated applicants for upcoming classes. Marine aviators interested in the challenges and rewards of TPS are encouraged to apply. Ideal career timing for selection is toward the end of an aviator's first fleet tour. Selection at that time allows a Marine to complete a test tour and return to the fleet for a second tour as a field grade officer. From there, Marines are well timed to compete for both operational and acquisition opportunities. Monitor MAR-ADMINS for selection board information, visit the TPS website at <http://www.navair.navy.mil/USNTPS>, and feel free to contact Maj P.C. Moran on staff at TPS with any questions at patrick.c.moran@navy.mil.

PROGRAM EXECUTIVE OFFICE, AIR ASW, ASSAULT AND SPECIAL MISSION PROGRAMS (PEO(A))

PMA-261 CH-53 PROGRAM OFFICE

CH-53 Engine Upgrade

Planned upgrades to the CH-53D Sea Stallion and CH-53E Super Stallion engines will give pilots more power on hot temperature and high altitude flights, and Marine Heavy Lift squadrons the ability to carry more equipment, weapons, supplies and personnel further.

Engines are already in test at HX-21. Two aircraft, one CH-53D and one CH-53E, are currently in test. They have both passed functional check flights and are proceeding to specific performance testing. The upgraded engines will increase payload capacity due to increased power. This increase in performance will result in greater capacity and flexibility in support of the USMC ground component.

The two General Electric T64-GE-413 turboshaft engines used on each CH-53D, which have been in service since 1969 carrying much needed supplies, equipment and personnel from ships to inland battle zones, will receive an upgraded fuel control along with other key improvements including erosion-resistant titanium nitride compressor airfoils and increased-durability hot section components. The upgraded engine and fuel control will transform the T64-GE-413 into the T64-GE-416.

The T64-GE-416 is currently used on the CH-53E Super Stallion, which has supported Marine Corps troops in Afghanistan and Iraq and continues supporting the global war on terror. The CH-53E's T64-GE-416 engines will also receive upgraded fuel controls, along with titanium nitride compressor airfoils and improved hot section components. The changes will turn T64-GE-416 engines into the more powerful T64-GE-419 engine.

The Navy's MH-53E Sea Dragon helicopter, a CH-53E derivative, already operates with three T64-GE-419 turboshaft engines for its primary mine countermeasures missions.

TiN

At this very moment somewhere in the harsh and unforgiving desert of Iraq or the Horn of Africa a CH-53E helicopter with a General Electric T64 turbine engine coated with "TiN," is delivering critical loads of supplies, taking troops from one hot spot to another, or maybe, as unfortunate as it is, performing a casualty evacuation.

TiN, is an erosion resistant multi-layer coating comprised of Titanium Nitride and other elements which is applied to compressor blades within gas turbine engines. With TiN-coated compressor blades, sand and dust particles that are ingested bounce off the blades without penetrating the surface. The coated blades do not erode and engine performance and reliability remains intact. This results in a decrease in maintenance time and vast improvements in mission capability.

In 2003, the Marine Corps began applying TiN coating to H-53 T64 engines to counter the effects of operating in the sand-laden environments in Iraq and Afghanistan. The reliability of the T64 engine, measured as time on wing, was significantly reduced because sand was eroding parts in the engine.

Helicopters with gas turbine engines that operate in harsh environments are at risk for extreme blade erosion. Desert operations expose engines to erosive material such as sand and dust, especially during take off and landing, leading to reduced engine performance and timely and expensive repairs.

In one 90-day period at the start of Operation Iraqi Freedom, deployed H-53 helicopters experienced an average engine time on wing of less than 150 hours. This low reliability imposed an enormous impact in terms of high maintenance burden, depletion of spare engines and engine modules, and operational limitations.

The Marine Corps and the DoN, having faced similar situations with the erosive effects of sand during Operation Desert Storm, on T64 engines began evaluating erosion-resistant engine airfoil coatings.

In 1997, the Foreign Comparative Test Program successfully evaluated a Russian erosion resistant titanium nitride coating developed to prevent turbine blade erosion on their Mi-24 and Mi-28 Hind attack helicopters. With the Russian-licensed coating technology in hand, MDS-PRAD Technologies Corporation along with engineers from NAVAIR and General Electric continued the development process necessary to qualify the change for use on Marine Corps' CH-53E heavy lift helicopters.

In June 2003, TiN-coated compressor airfoils were being delivered for assembly on T64 engines. The first T64 TiN engine was installed in a CH-53E in April 2004. The resulting performance was better than expected.

A TiN-coated T64 engine was removed from a CH-53E helicopter in Iraq in July 2007. That engine had been on wing for three and a half years and accumulated over 2000 flight hours of usage.



Personal Cooling Vest

Temperatures in aircraft cabins and cockpits can reach 130 degrees in Iraq, Afghanistan and the Horn of Africa. To help relieve some of the physical stress that happens as a result, Patuxent River is helping to bring personal cooling systems to several Marines deployed to such high-temperature climates this summer.

Although it's hot, warfighters must wear heavy protective gear, which can include helmets, body armor, flight suits, and possibly an additional layer to protect them

in chemical and biological threats. Their tasks within the aircraft often include moving and loading cargo, aiming at targets, and ensuring that other warfighters who are in transport are safely seated – all things that can make it feel even hotter.

Four of the cooling systems were delivered to Marines with the HMH-464 Detachment in Djibouti, in the Horn of Africa. The Marine Corps wanted to work as quickly as possible. To avoid having to go through a lengthy acquisitions process, the system is built upon a concept already tried, tested and implemented by the Army. Funding to install was only three months.

This summer, more cooling units will be installed. The exact number has still to be determined. After the summer, it will take about four years to get all H-53's outfitted with the cooling system.

Future developments could make the units smaller and portable, something that could be worn while Marines work, rather than being attached to the walls of the aircraft. The system can also be used to cool the body after completing a mission. The vest – the microclimate cooling garment – is worn over a t-shirt or the skin. The system contains tubing which is conceptually like a radiator. A cool mixture of water and glycol is pumped through piping within the vest. The pumping action is made possible with a larger tube, commonly called the umbilical, connected to the outside of the vest. The other end of the umbilical tube is connected to a unit similar in size to a car battery. The other end of that unit is connected to the aircraft for power.

PMA-274 PRESIDENTIAL HELICOPTER PROGRAM OFFICE

Presidential Helicopter Begins Flight Test

The first two VH-71 helicopters built for the President of the United States have entered the flight test phase with the USN and USMC at NAS Patuxent River in Maryland.

The Navy-owned test vehicles, TV-2 and TV-5, arrived at NAS Patuxent River in November and December, respectively, aboard a U.S. Air Force C-17 cargo plane from AgustaWestland's facility in Yeovil, England. The government and industry integrated test team will use the aircraft primarily for structural and propulsion testing, and pilot training.

The two test vehicles are the first of four test aircraft built for the initial phase of the VH-71 program known as Increment One. Two more will undergo additional assembly and missionization at Lockheed Martin Systems Integration in Owego, NY prior to being transferred to NAS Patuxent River this year for testing of the avionics and mission systems. TV-1, an industry-provided test asset, has been in flight test since shortly after the contract award, and currently has 555 flight hours with the program. Over the next eight months, all Increment One aircraft will be delivered including the initial lot of five presidential helicopters.

Lockheed Martin Systems Integration – Owego is the prime contractor and systems integrator for the Navy's VH-71 Presidential Helicopter Replacement program with overall responsibility for the program and aircraft system.

AgustaWestlandBell, the U.S. principal subcontractor to Lockheed Martin, has responsibility for the basic air vehicle design, production build, and basic air vehicle support functions. More than 200 U.S. suppliers support the VH-71 program.



VH-71A in test flight